

Appl. No. 10/695,447 Ledru et al response to office action

IN THE TITLE

Please change the title to read:

--Circuit Breaker Comprising A Control Assembly And Interrupting
Chamber And Method Of Assembly--.

It would be appreciated if the Examiner would indicate the
acceptance of the new title in the next office communication.

IN THE SPECIFICATION

On page 1, prior to line 4, insert the heading and subheading:

--BACKGROUND OF THE INVENTION

Field of the Invention--.

On page 1, line 9, delete the subheading "BACKGROUND OF THE INVENTION" and insert, --Description of the Preferred Embodiment--.

Please replace the section beginning on Page 2, line 20 and ending on Page 5, line 32 with the following section.

OBJECTS AND SUMMARY OF THE INVENTION

In this context, an object of the invention is to provide a circuit-breaker that makes it possible to remedy the above-mentioned drawbacks.

More particularly, an object of the invention is to provide such a circuit-breaker whose synchronization assembly makes it possible to transmit high torque.

A further object is to provide such a circuit-breaker whose synchronization assembly can be fitted on both control shafts of the circuit-breaker, by turning the shaft of the interrupting

chamber through an angle that is small, in particular less than 0.2°.

Finally, an object of the invention is to provide such a circuit-breaker whose synchronization assembly has small clearances when in operation, while offering satisfactory flexibility, in particular as regards assembling it and disassembling it.

To this end, the invention provides a circuit-breaker comprising a control assembly having a "driving" first splined control shaft, said circuit-breaker also comprising an interrupting chamber having at least one moving arcing contact and also a "driven" second splined control shaft suitable for moving the moving contact between opening and closure positions, said circuit-breaker further comprising a synchronization assembly for synchronizing said driving and driven shafts, said synchronization assembly comprising two levers, each of which is provided with a splined ring suitable for co-operating with a corresponding shaft, and two connection rods, each of which is hinged at both of its ends to respective ones of said levers;

wherein one of said rings has a number of meshing elements that is different from the number of meshing elements on the splined shaft with which it co-operates, and wherein an adapter is interposed between said ring and said shaft, said adapter

having internal meshing elements suitable for co-operating with the meshing elements on the driving shaft, and external meshing elements suitable for co-operating with the meshing elements on said splined ring.

According to other characteristics of the invention:

the number of meshing elements on said splined ring and the number of meshing elements on the control shaft are mutually prime numbers;

the absolute value of the difference between firstly the number of meshing elements on the control shaft and secondly the number of meshing elements on said splined ring is equal to 1;

the smaller of the numbers of meshing elements on the control shaft and of meshing elements on the splined ring is greater than twelve, and preferably greater than twenty six;

the control shaft has thirty-six meshing elements while the splined ring has thirty-five meshing elements;

the adapter is marked with an identification marker extending radially and/or angularly;

the identification marker extends between an internal setback and an external meshing element, both of which are in alignment, on the link element;

the identification marker is situated radially in register with another marker provided on the splined ring and/or on the

control shaft; and

the other splined ring has the same number of meshing elements as the control shaft on which it is mounted, so as to co-operate directly with said control shaft.

The invention also provides a method of assembling the circuit-breaker as defined above, the method comprising the following steps:

the other splined ring is mounted on its shaft;

the inside periphery of the splined ring is disposed in the vicinity of the outside periphery of its control shaft, so that said inside and outside peripheries form a gap between them; and

the link element is inserted into said gap so as to cause it to co-operate both with the control shaft and with the first splined ring.

According to other characteristics of the invention:

before the link is inserted into the gap:

a hollow auxiliary member is used that has internal meshing elements that are identical to the internal meshing elements on the adapter, said auxiliary member having an external periphery such that it can be inserted into the gap without interfering with the splined ring, said auxiliary member being provided with uniformly-distributed radial marks, the number of which is identical to the number of said internal meshing elements on the

auxiliary member;

the auxiliary member is inserted into the gap;

an "optimum" one of said radial marks is identified that corresponds to a free insertion position in which the adapter can be inserted freely into the gap;

said other marker corresponding to said free insertion position is formed on said splined ring and/or on the shaft;

said auxiliary member is removed from the gap; and

the adapter is inserted into said gap, in said optimum insertion position;

while the adapter is being inserted into the gap, the identification marker on the adapter is aligned with said other marker on the splined ring and/or on the shaft;

each radial mark on the auxiliary member extends from an internal setback in said auxiliary member, between two adjacent meshing elements; and

the optimum radial mark is identified, which optimum mark is centered optimally relative to a facing setback in the splined ring, and/or relative to a facing meshing element on the shaft.

The invention finally provides an auxiliary member for implementing the method of assembly as defined above, said auxiliary member being hollow and having internal meshing elements provided on its inside periphery, as well as uniformly-

distributed radial marks, of which the number is identical to the number of said internal meshing elements.

According to other characteristics of the invention:

each radial mark extends from a setback provided between two internal meshing elements; and

the auxiliary member has a smooth outside periphery, in particular a circularly cylindrical outside periphery.